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TECHNOLOGY OF MEDICAL AND PSYCHOLOGICAL CARE OF CHILDREN AND ADOLESCENTS WITH TYPE 1 DIABETES MELLITUS

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ABSTRACT

The need to develop a system of rehabilitation programs for various stages of medical care providing to children with type 1 diabetes mellitus (DM) is due to a significant increase in the number of children with diabetes mellitus (DM) in recent times, a severe course of the disease, insufficient effectiveness of treatment and the absence of out-of-hospital rehabilitation of children's patients. Further development of rehabilitation programs for children and adolescents with Type 1 diabetes, basic awareness of the patient and his family regarding the disease and treatment methods is required. Despite the fact that a significant number of scientific studies are devoted to the problems of DM, there are difficulties in introducing an existing innovative product due to its isolation, diversity, organizational and other barriers in the process of transfer to real clinical practice.

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Introduction. Treatment and rehabilitation of children with Type I diabetes mellitus (DM) is a complex, multi-level problem that is traditionally considered, as a rule, within the framework of the medical paradigm. At the same time, this presentation needs to be clarified and expanded, since not only the primary prevention of psychosomatic diseases is located outside the limits of medicine, but also the most important section – medical and psychological support and rehabilitation due to the severity of diabetes, its consequences and complications in childhood [1-6]. Rehabilitation measures are also important in the long run, when patients with Type 1 diabetes move to the senior age category (≥18 years), when compliance is based on the acquired knowledge base in childhood and adolescence, but also reinforced by a continuous system of medical and psychological support in older age [7-8]. All this requires the solution both as global medical, social, organizational problems, and extremely important narrow medical, medical-psychological, medical-pedagogical, and medical-social problems, which ultimately determines the effectiveness of treatment and rehabilitation. Currently, neurodiabetologists have accumulated quite a lot of experience in the treatment of diabetes in adults. There are also a number of ideas regarding the treatment and rehabilitation of children at both early and distant stages of the disease, options and models for organizing this process are proposed [9]. However, there is still no single concept of neurorehabilitation of children and adolescents with type 1 diabetes, which would be based on early diagnosis, stages and continuity of corrective and preventive measures.

Research Purpose. Development of children and adolescents with type 1 diabetes neurorehabilitation model based on a comprehensive neuropsychological study.

Research Materials and Methods. A comprehensive study of children was performed in the Department of Endocrinology of the State Institution Clinic of the State Institution "ICAHC NAMS" in the period 2010-2020. 480 children from 6 to 18 years old were examined. Research design: psychopathological, somatoneurological methods, package of psychological methods (Lusher tests,

A. Bassa-Darky, Kattela, Projective Drawing test "Me and My Disease", Method of 10 Words Memorizing (A. R. Luria, 1964), "Scale of Family Environment "(S. Yu. Kupriyanov, 1985), "Scale of Family Adaptation and Cohesion" (FACES-3, D. Ch. Olson, 1986), Family Sociogram (E. G. Eidemiller, 1996).

Results and their Discussion. Mental, psychological and neurological symptoms in children with diabetes are an integral component that manifests itself at all stages of the development of the underlying psychosomatic disease.

Children and adolescents with diabetes have been found to have short-term memory disorders. Thus, with the practical preservation of the original memory volume, the dynamic side of mnestic activity is disrupted. As the duration of DM disease increases for more than 5 years ($r=0.546$), the rigid and asthenic neuropsychological type of minimal brain dysfunction increases. In adolescents with DM, it is traced that as the duration of the disease increases, the G factor (Cattel's test) – "high normativity of behavior, integrity, responsibility" - increases ($p<0.05$). The development of super-ego qualities is associated with the need to develop the skills of adaptation to chronic disease ("negative reinforcement" according to Skinner and Thorndike).

The structure of aggressive reactions in children and adolescents varies depending on the duration of the DM. In the group of subjects with disease duration up to 1 year, physical aggression and negativism prevail; from 1 year to 5 years – resentment, hostility; from 5 years or more – resentment, a sense of guilt. It is established that as the duration of the disease increases (5 years or more), the level of emotional stress increases significantly.

Considering the conceptuality of the disease, therapy and rehabilitation in DM in children and adolescents, it is necessary to note the expressed psychotraumatic experience of the fact of disease, prolonged emotional tension, changes in the hierarchy of motives and needs, development of personal features, including the formation of maladaptive symptom complexes and aggressiveness. In these cases, the somatic pathological process is largely determined by psychosocial conditions.

Based on many years of experience, the state institution "Institute for Children and Adolescents Health Care of the NAMS of Ukraine" has created the concept of neurorehabilitation and a program of medical and psychological assistance at various stages of DM in children. A set of measures in the field of social psychiatry, neurology, and medical and psychological rehabilitation of children with early and late CNS complications has been developed and scientifically justified.

Mental, psychological and neurological symptoms in children with diabetes are an integral component that manifests itself at all stages of the development of the underlying psychosomatic disease.

It is established that the psychological attitude of a child to his/her disease was formed under the influence of psychosocial stressors, of which the most important for children were stressors that affect physical functioning (non-acceptance of repeated injections, pain characteristics of the disease). The most significant in the formation of psychological maladaptation of children with DM was the emotional state of the mother (anxiety, depression), and in adolescents – frustration in the "life with diabetes" system, associated with the social significance of the disease, its impact on relationships with peers and on the sphere of interests and entertainment, as well as external manifestations of DM (diabetic blush, lipodystrophy, tissue necrobiosis, delayed growth and sexual development).

Personal symptom complexes of children with DM were determined by disease duration. In the dynamics of the disease, the structure of aggressive changes in children and adolescents with DM undergoes significant changes: the longer the disease duration, the lower the level of aggression (physical, verbal, indirect), but the higher the level of hostility and resentment.

Clinical and dynamic observations of children with DM have established that in the conditions of chronic disease, the child's personal self-identification and intrapsychic adaptation are disrupted. In their formation, the most significant are the age of the child, period of DM manifestation, disease severity and duration, specific and non-specific stressors, presence of pathology of brain regulatory mechanisms.

Clinical practice based on longitudinal observation of 480 children and adolescents shows that the highest effectiveness of neurorehabilitation can be achieved only by observing a number of conditions: early onset of neurorehabilitation, its continuity, neuropsychological and psychopathological diagnostics, personified application of medical and psychological support programs, monitoring of somatoneurological, mental and psychological health. We included the

prognosis of DM, solution of social-psychological problems and the inclusion of family members in the rehabilitation process at all stages of the disease into the rehabilitation.

We have developed and proposed a model of psychological support for children with DM. The diagnostic component of the model includes: assessment of somatic health (with the definition of functional and structural disorders of organs and systems), mental health (with the identification of psychosocial functioning disorders signs –the ability to acquisition of knowledge, the adequacy of emotional functioning, productive activities in the micro - and macrosocium); determination of mental activity disorders (memory disorders, attention disorders, perception disorders, emotions, intelligence, discretion, consciousness) and the depth of psychopathology.

Mental health monitoring is based on somatoneurological, psychopathological, and neuropsychological research of children with DM in the disease dynamics. The first level of monitoring involves Express Diagnostics of neuropsychiatric disorders and psychological state. When diagnosing psychopathology and adaptation disorders (level 2), a differentiated program of medical and psychological support for a child with DM was formed. The third level includes monitoring the somatoneurological, mental and psychological health of a teenager with psychosomatic illness with the definition of a strategy for the treatment of neuropsychiatric disorders.

The psychodiagnostic module provides for the determination of the individual character of the psychological side of the disease – study of the cognitive sphere (thinking, memory), determination of personal characteristics of the child and psychological factors of trauma.

Based on the integral assessment of somatoneurological, mental, and psychological health of children and adolescents aged 2 to 18 years suffering from DM from the period of disease manifestation up to 10 years or more, an algorithm for social insufficiency diagnostics has been created (Fig.1), providing a pathogenetic basis for psychoprophylaxis of disability progression.

When forming the tactics of psychotherapeutic correction and psychological rehabilitation, the child's mental health (verified clinical material reflecting psychopathological and pathopsychological reality) was chosen as a system-forming factor in the quality of mental and social functioning of a child with DM.

The development of a three-level model of mental health monitoring is based on somatoneurological, psychopathological, and psychological research of patients in the dynamics of DM disease:

The first level is express method of neurological and mental disorders diagnostics.

The second level is when identifying any signs of diabetic encephalopathy, a differential diagnostic algorithm for determining the degree of severity is used. When mental health disorders diagnostics, a specific individual program of medical and psychological support is formed for each child.

The third level is monitoring the somatoneurological, mental and psychological health of a child with DM with the definition of therapy strategy, prevention of the progression of social insufficiency.

In case of detection of neurological and psychopathological symptoms, modern therapy regimens are prescribed against the background of insulin therapy. At the same time, it is important to take into account the somatotropic effects of psychopharmacotherapy and the drug interaction of psycho- and somatotropic drugs. Pharmacological correction is implemented using drugs that improve metabolic processes in the brain, cognitive functioning, normalize cerebral blood circulation, conducting of nerve pulse along peripheral nerve fibers, and the blood lipid spectrum.

Considering the role of the family as a powerful rehabilitation factor, we used data concerning the type of attitude to a sick child in the family, as well as the results of projective drawing tests "Kinetic Drawing of the Family", "Family Sociogram" as a thesaurus to the concept of pathological and non-pathological types of destructive family relationships.

The conceptuality of the neuropsychiatric and psychological rehabilitation program includes diagnostic and correction modules.

The diagnostic module provides for determining the individual character of the psychological side of the disease. This module includes 3 interconnected main blocks:

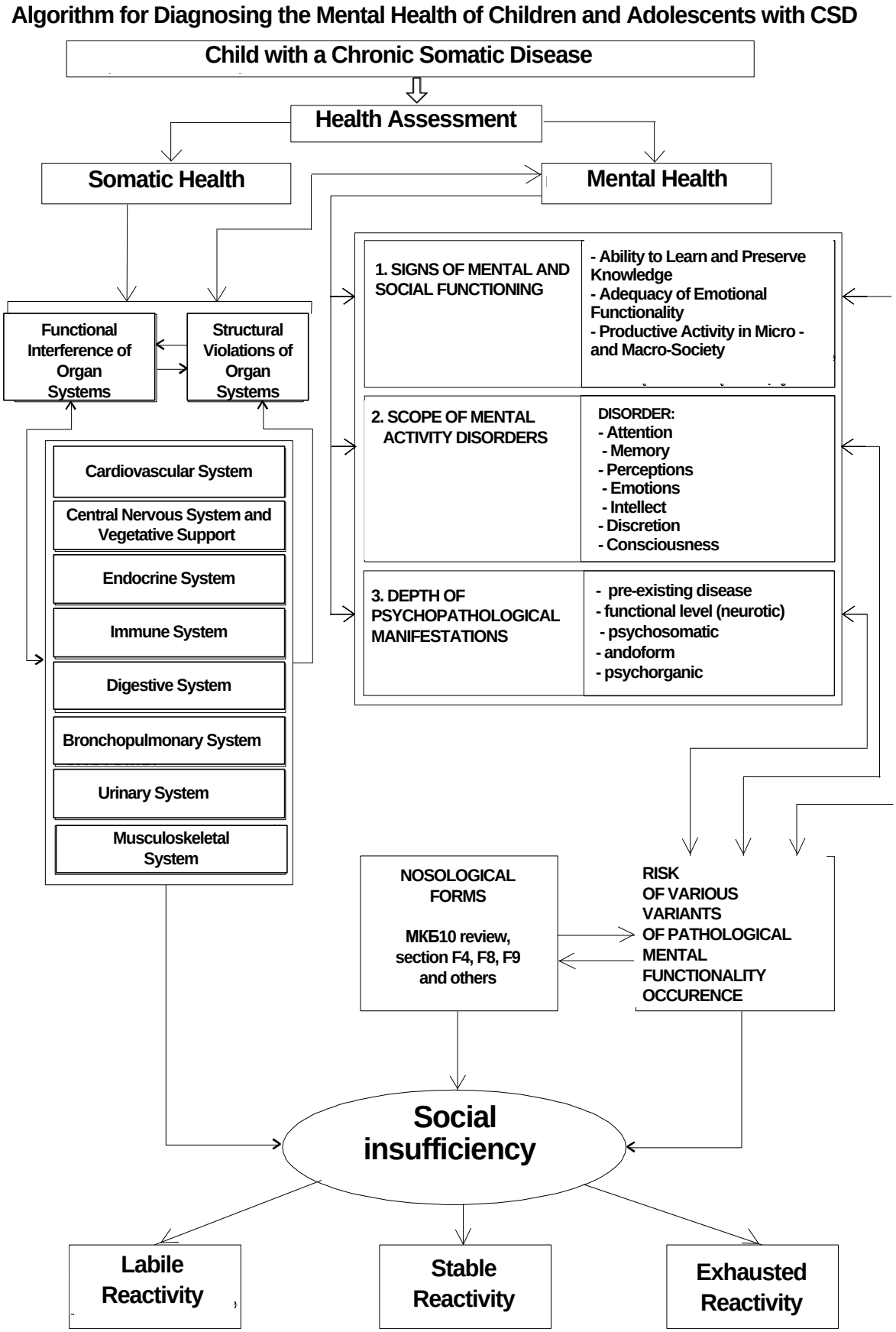
Algorithm for Diagnosing the Mental Health of Children and Adolescents with CSD
Child with a Chronic Somatic Disease
Health Assessment
Somatic Health
Mental Health
Functional Interference of Organ Systems
Structural Violations of Organ Systems
Cardiovascular System
Central Nervous System and Vegetative Support
Endocrine System
Immune System
Digestive System
Bronchopulmonary System
Urinary System
Musculoskeletal System
1. SIGNS OF MENTAL AND SOCIAL FUNCTIONING
- Ability to Learn and Preserve Knowledge
- Adequacy of Emotional Functionality
- Productive Activity in Micro - and Macro-Society
2. SCOPE OF MENTAL ACTIVITY DISORDERS
DISORDER:
- Attention
- Memory
- Perceptions
- Emotions
- Intellect
- Discretion
- Consciousness
3. DEPTH OF PSYCHOPATHOLOGICAL MANIFESTATIONS
- pre-existing disease
- functional level (neurotic)
- psychosomatic
- andoform
- psychorganic
NOSOLOGICAL FORMS
MKB10 review, section F4, F8, F9 and others
RISK OF VARIOUS VARIANTS OF PATHOLOGICAL MENTAL FUNCTIONALITY OCCURENCE
Social insufficiency
Labile Reactivity
Stable Reactivity
Exhausted Reactivity

Fig. 1

Block I - determination of psychological factors of traumatization (psychosomatic pattern) based on the gestalt approach (dialog technique);

Block II - determination of personal characteristics of children and adolescents with DM;

Block III - determination of the intellectual and cognitive sphere of children and adolescents with DM.

The correction module is implemented in the format of individual and group psychological correction using the methods of art therapy, cognitive behavioral therapy, gestalt therapy, family psychotherapy, and psycho-educational programs.

The use of art therapy as a means of psychological analysis, psychological information and diagnostics of the severity of subclinical and clinical emotional problems in children with diabetes allows differentiating the severity of psychosocial stressors. Diagnostic work provides for a focus of the problem psychological field with psychosomatic core determination. Psychological correction allows to create the most optimal conditions for the transformation of identified pathological maladaptive patterns of emotional response in a safe situation. The program provides for determination of the type of disease internal picture with the identification of emotional, behavioral, cognitive components and the most vulnerable psychosomatic patterns that prevent child adequate adaptation in the system of chronic endocrine crippling disease.

Psychotherapeutic intervention provides for transformation of pathological mechanisms of psychological protection: at the level of perception, at the level of transformation and at the level of information. If there is no effectiveness, elements of behavioral therapy, coping mechanisms are included. There is a displacement or blocking (braking) of emotions that cause psychic tension; regression of rigid attitudes.

Gestalt therapy plays a significant role in the rehabilitation of adolescents with DM. The basis of the therapeutic process is the awareness and experience of contact with oneself and others (blocking removing and stimulating the process of emotional development). The principle of personal self-regulation means constant orientation in relation to the state and course of phenomena and processes occurring in the body. The concept of "awareness" is used in a broad sense, covering "to know", "to distinguish", "to be self-conscious about" (I. Klassen, 2004). The therapist's attention and activity are focused on helping the teenager to expand and enrich the area of consciousness. Gestalt therapy techniques and exercises are aimed at consciousness expanding (training in internal zone awareness; external zone awareness), opposites integrating (training in relation to internal conflict-"attacking" – "defending"), increasing attention to feelings (training), taking responsibility for themselves.

At all stages of DM disease, family psychotherapy was used, including: psychodynamic component (studying the psychological mechanisms of family conflict and related problems, solving the problem of "disabled child" in the family); behavioral component (achieving behavioral goals by positive reinforcement); strategic component (with fixation on solving a specific problem). Using the family sociogram test allows quickly diagnose relationships in the family and use them in the process of psychotherapy. The focus of specialists was also aimed at the mother's anxiety factor, as a factor of environmental trauma that supports the violation of the child's emotional homeostasis.

Cognitive and motor method of neuropsychological correction is aimed at restoring contact with your own body, relieving body tension, awareness of your problems, and developing nonverbal components of communication.

Compliance and regression of neuropsychological symptoms in children with DM are achieved in 78.6% of cases.

Testing of the proposed methods of neurorehabilitation in the conditions of a comprehensive system of assistance providing to children and adolescents with Type 1 DM showed the greatest effectiveness in the conditions of an endocrinological hospital with active training in a Self-Control School, and subsequent rehabilitation in a specialized sanatorium.

Conclusions. An effective neuropsychological model of children and adolescents with DM rehabilitation has been developed. The use of systematic model of psychological rehabilitation of children with DM has a positive effect on the neuropsychiatric and psychological development, increases stress resistance, and expands the level of social competence of a disabled child.

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